or the new description of the Morgan gems, which is to present the finest combination of realistic accuracy and artistic beauty yet attained. GEORGE F. KUNZ.

Laboratory Exercises in Physical Chemistry. By FREDERICK H. GETMAN, Ph.D. New York, John Wiley & Sons. 1904. Pp. 241.

Laboratory manuals in physics and in chemistry separately have been put upon the market during the last twenty years in sufficient number to satisfy all reasonable demands on the part of the general public. But during this interval a field that overlaps both of these has become differentiated, the start being made by Ostwald, whose work has been taken up and enlarged by a considerable number of ardent workers. Many of the laboratory operations involved are not provided for in the current manuals in English. Ostwald's 'Physiko-Chemische Messungen' and Traube's 'Physikalish-Chemische Methode' cover the ground well in German, but, as is so often the case in German books, the amount of detail involved in the effort to be exhaustive, and the large number of references to researches not easily found in most American college libraries, deprive them of much of their value for American beginners.

Dr. Getman's admirable little book has been prepared with constant recognition of the American demand for directness and economy. His own experience during the last few years in Johns Hopkins University, where physical chemistry was the subject in which his doctor's thesis was prepared, has been linked on to several years of previous experience in the teaching of chemistry. His effort has been to select only such methods for presentation as he has found to be typical and worthy of preference. He has very decidedly the teacher's instinct, exhibiting much aptitude in the art of arrangement and of clear expression. Although the book is not yet two months out of press, it has been already adopted in a number of university laboratories. It certainly meets well the needs of the beginner in physical chemistry and is worthy of special commendation as a handbook.

The range covered may be briefly indicated. In the introductory chapters the author discusses the theory and use of the balance; volume and density; viscosity and surface tension; and the determination of solubility. Thermometry and calorimetry are then considered, and a chapter on optical measurements is introduced. This is followed by several chapters on electrical measurement of conductivity, electromotive force, current and the dielectric constant. The last chapter is on chemical kinetics as illustrated in reactions of the first order, like the inversion of cane sugar, and of the second order, like certain cases of saponification.

The book closes with a well-selected series of tables and an index.

W. LE CONTE STEVENS.

DISCUSSION AND CORRESPONDENCE.

THE USE OF ROMAN NUMERALS.

ROMAN numerals are frequently used to designate the volume of a serial in bibliographic references. Instead of writing Vol. 88, or merely 88 after the name of the serial, we go to the trouble to write LXXXVIII. Why? Simply because we have seen others do it, and have unreflectively imitated them. When we are forced to defend our usage we find that there are few reasons for the use of the Roman system, whereas there are many reasons for the use of the Arabic system. Those who are intelligently in favor of the Roman numerals in bibliographic work argue that the use of them enables us to avoid the abbreviation for volume, while at the same time we thus distinguish sharply between volume and part, or volume and page. They, furthermore, urge that it is well for us to conform to the usage of publishers. But these arguments should be considered in the light of the following facts.

Although no one would deny that it takes much longer to write and read the Roman numerals than the Arabic, and that we are far more likely to make mistakes in dealing with the former system, few of us realize how great the difference in the ease and accuracy with which we use the two systems really is. In order that my arguments for the use of Arabic instead of Roman numerals, not alone